

CLAIMS

We claim:

1. A structural member comprising:

a top member;

5 a bottom member extending generally parallel to and beneath the top member;

and

10 a plurality of wing members positioned between the top member and the bottom member, wherein each wing member has a center segment which is hinged to the bottom member to pivot about a first axis and hinged to the top member to pivot about a second axis which is parallel to the first axis, and wherein at least one wing extends from each wing member center segment and is biased to project out of a first plane defined between the first axis and the second axis, such that the structural member is transformable from a first collapsed condition to an expanded condition in which the wings project out of the first planes to thereby support the top member above the bottom member and to resist the return of the structural member to the collapsed condition.

15 2. The structural member of claim 1 wherein the top member and the bottom member are planar sheets.

20 3. The structural member of claim 1 wherein all the first axes and the second axes of the plurality of wing members are parallel.

4. The structural member of claim 1 wherein the wing members are positioned to approximate a hexagonal cell pattern extending between the top member and the bottom member.

5. The structural member of claim 1 wherein each wing is curved about an axis which is perpendicular to the first and second axis.

6. The structural member of claim 1 further comprising a fastener which connects the top member to the bottom member in the first collapsed condition.

5 7. The structural member of claim 6 wherein the fastener comprises at least one segment of adhesive tape, and wherein a cord is disposed beneath the adhesive tape with at least one protruding free end, such that pulling the cord severs the tape and permits the top member to be displaced from the bottom member.

10 8. The structural member of claim 1 further comprising at least one edge finish tab extending from a selected member of the top member and the bottom member, the at least one edge finish tab comprising:

an end wall which is hinged to the selected member; and

15 a fastening flap which is hinged to the end wall, wherein in the first collapsed condition the at least one edge finish tab is folded back to lie adjacent to the outside surface of the selected member, and wherein in the erected configuration, the at least one edge finish tab is rotated to bring the fastening flap into engagement with the top member or the bottom member which is opposite the selected member, and affixed thereto.

20 9. The structural member of claim 8 further comprising at least one fastener mounted to the fastening flap of the at least one edge finish tab, the at least one fastener being positioned to engage a like fastener on another structural member positioned alongside.

10. The structural member of claim 1 wherein the at least one wing member is a part of a strip having three sections, a bottom attachment section which is fixed to the bottom member, a wing section which is hinged to the bottom attachment section along a first hinge axis, and a top attachment section which is hinged to the wing section along a second hinge axis and fixed to an underside of the top member, wherein the first hinge axis is parallel to the second hinge axis, and wherein the wing section has a plurality of wings.

11. The structural member of claim 1 wherein in the first collapsed condition the structural member is rolled into a roll.

12. The structural member of claim 1 further comprising a base section fixed to the bottom member having a projecting resilient tab corresponding to each wing, the tabs being biased in an upwardly projecting position, a slot being defined adjacent each tab, such that in the first collapsed condition, each tab is overlain by a wing, and in the expanded configuration each wing passes over a tab to be engaged within one of the slots.

13. A structural member comprising:

a top member;

a bottom member extending generally parallel to and beneath the top member;

and

at least one strip having three sections, a bottom attachment section which is fixed to the bottom member, a wing section which is hinged to the bottom attachment section along a first hinge axis, and a top attachment section which is hinged to the wing section along a second hinge axis and fixed to the underside of the top member, wherein the first hinge axis is parallel to the second hinge axis, and wherein the wing section has a plurality of wings, each wing extending from a center segment and being biased to project out of a plane defined between the first axis and the second axis, such that the structural member is transformable from a first collapsed condition to an expanded condition in which the wings project out of the first plane to thereby support the top member above the bottom member and to resist the return of the structural member to the collapsed condition.

14. The structural member of claim 13 wherein the top member and the bottom member are planar sheets.

15. The structural member of claim 13 wherein all the first axes and the second axes of the plurality of wing members are parallel.

16. The structural member of claim 13 wherein the wing members are positioned to approximate a hexagonal cell pattern extending between the top member and the bottom member.

17. The structural member of claim 13 wherein each wing is curved about an axis which is perpendicular to the first and second axes.

18. The structural member of claim 13 further comprising a fastener which connects the top member to the bottom member in the first collapsed condition.

5 19. The structural member of claim 18 wherein the fastener comprises at least one segment of adhesive tape, and wherein a cord is disposed beneath the adhesive tape with at least one protruding free end, such that pulling the cord severs the tape and permits the top member to be displaced from the bottom member.

10 20. The structural member of claim 13 further comprising at least one edge finish tab extending from a selected member of the top member and the bottom member, the at least one edge finish tab comprising:

an end wall which is hinged to the selected member; and

15 a fastening flap which is hinged to the end wall, wherein in the first collapsed condition the at least one edge finish tab is folded back to lie adjacent to the outside surface of the selected member, and wherein in the erected configuration, the at least one edge finish tab is rotated to bring the fastening flap into engagement with the top member or the bottom member which is opposite the selected member, and affixed thereto.

20 21. The structural member of claim 22 further comprising at least one fastener mounted to the fastening flap of the at least one edge finish tab, the at least one fastener being positioned to engage a like fastener on another structural member positioned alongside.

22. The structural member of claim 13 wherein in the first collapsed condition the structural member is rolled into a roll.

23. A structural member comprising:

a planar top member;

a planar bottom member extending generally parallel to and beneath the top member; and

5 a plurality of wing members positioned between the top member and the bottom member, wherein each wing member has a center segment which is connected to the bottom member to pivot about a first axis and connected to the top member to pivot about a second axis which is parallel to the first axis, and wherein the first axis and second axis of each center
10 segment defines a first plane, and wherein at least one wing extends from each wing member center segment and is biased along a front to back axis to project out of the first plane, such that the structural member is transformable from a collapsed condition in which the at least one wing extends generally parallel to the top member and the bottom member,
15 and an expanded condition in which each at least one wing projects out of the first planes to thereby support the top member above the bottom member and to resist the return of the structural member to the collapsed condition, wherein in the expanded condition the top member is shifted in the front to back axis from its position with respect to the bottom
20 member in the collapsed condition.

24. The structural member of claim 23 wherein the wing members are positioned to approximate a hexagonal cell pattern extending between the top member and the bottom member.

25. The structural member of claim 23 wherein each wing is curved about an axis which is perpendicular to the first and second axis.

26. The structural member of claim 23 further comprising a fastener which connects the top member to the bottom member in the first collapsed condition.

27. The structural member of claim 26 wherein the fastener comprises at least one segment of adhesive tape, and wherein a cord is disposed beneath the adhesive tape with at least one protruding free end, such that pulling the cord severs the tape and permits the top member to be displaced from the bottom member.

28. The structural member of claim 23 wherein in the first collapsed condition the structural member is rolled into a roll.

29. The structural member of claim 23 further comprising a base section fixed to the bottom member having a projecting resilient tab corresponding to each wing, the tabs being biased in an upwardly projecting position, a slot being defined adjacent each tab, such that in the first collapsed condition, each tab is overlain by a wing, and in the expanded configuration each wing passes over a tab to be engaged within one of the slots.

30. A structural member comprising:

a top member;

a bottom member extending beneath the top member;

an array of a plurality of wing members, each wing member comprising:

5 a center segment pivotably connected about a first axis to the bottom member, and pivotably connected about a second axis to the top member, a first plane being defined by the first axis and the second axis;

10 a first wing extending sidewardly of the center segment on a first side, and biased to project from the center segment out of the first plane; and

15 a second wing extending sidewardly of the center segment on a second side spaced from the first side, and biased to project from the center segment out of the first plane, wherein in a first collapsed configuration the top member is spaced a first distance from the bottom member, and in a second expanded configuration the top member is spaced a second, greater, distance from the bottom member, and the first wings and the second wings are biased out of the first planes.

20 31. The structural member of claim 30 wherein each wing is curved about an axis which is perpendicular to the first and second axis.